Jessie Thwaites – Curriculum Vitae

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Education

PhD Candidate in Physics Current

Wisconsin IceCube Particle Astrophysics Center and University of Wisconsin—Madison Physics Department, Madison, WI
Advisor: Justin Vandenbroucke

Bachelor of Arts, Physics (minors: mathematics, music) May 2019

College of Saint Benedict/Saint John's University, St. Joseph, MN
Advisor: Jim Crumley
Honors: Summa cum laude

Research Experience

PhD Research (Particle astrophysics) Jan. 2021—present

Wisconsin IceCube Particle Astrophysics Center and University of Wisconsin—Madison Physics Department, Madison, WI
Advisor: Justin Vandenbroucke
Topic: Neutrino source searches in realtime and archival data with the IceCube Neutrino Observatory

Austrian Fulbright-Marshall Plan Award Grant for Research in STEM Sept. 2019—May 2020

Space Sciences Institute, Austrian Academy of Sciences (IWF-ÖAW), Graz, Austria
Advisor: Rumi Nakamura
Topic: Analysis of nightside current sheet crossings and plasma turbulence using Magnetospheric Multiscale (MMS) mission data

Undergraduate Research (MapCores Program) Aug. 2017—May 2019

Physics Department, College of Saint Benedict/Saint John's University, St. Joseph, MN
Advisor: Jim Crumley
Topic: Development of a model (in IDL) for solitary waves in Earth's magnetosphere

NSF-REU student, University of Washington June—Aug. 2018

Center for Experimental Nuclear Physics and Astrophysics (CENPA), Seattle, WA
Advisor: Alejandro Garcia
Topic: Development of multipole expansion code (ROOT/C++) for a superconducting solenoidal magnet for He6-CRES experiment

NSF-REU student, LASP June—July 2016

Laboratory for Atmospheric and Space Physics, University of Colorado at Boulder, Boulder, CO
Advisor: Karlheinz Trattner
Topic: Analysis of Polar satellite data for anomalous magnetic reconnection events

Selected Peer-reviewed Publications

Publications where I had a major contribution in the work.

For full list of publications: ORCID, INSPIRE-HEP

- **IceCube Collaboration**, R. Abbasi *et al*. "Search for sub-TeV Neutrino Emission from Novae with IceCube-DeepCore" *ApJ* **953** 160 (2023). DOI: 10.3847/1538-4357/acdc1b
- **IceCube Collaboration**, R. Abbasi *et al*. "Limits on Neutrino Emission from GRB 221009A from MeV to PeV Using the IceCube Neutrino Observatory" *ApJL* **946** L26 (2023). DOI: 10.3847/2041-8213/acc077
- A. Desai, J. Vandenbroucke, S. Anandagoda, **J. Thwaites**, M.J. Romfoe. "Constraints on the Origins of the Galactic Neutrino Flux Detected by IceCube" *ApJ* **966** 23 (2024). DOI: 10.3847/1538-4357/ad2a5e

Conference Proceedings

- **IceCube** Collaboration, J. Thwaites, A. Balagopal V., S. Hori, M.J. Romfoe, A. Zhang, "Searches for IceCube Neutrinos Coincident with Gravitational Wave Events" *PoS* **ICRC2023** (2023) 1484
- **IceCube** Collaboration, J. Thwaites, J. Vandenbroucke, "IceCube search for neutrinos from novae" *PoS* **ICRC2023** (2023) 1560
- **IceCube** Collaboration, K. Kruiswijk, B. Brinson, R. Procter-Murphy, J. Thwaites, N. Valtonen-Mattila, "IceCube search for neutrinos from GRB 221009A" *PoS* **ICRC2023** (2023) 1511.
- **IceCube** Collaboration, A. Desai, J. Thwaites, J. Vandenbroucke, "Exploring the Galactic neutrino flux origins using IceCube datasets" *PoS* **ICRC2023** (2023) 1048

Selected Public Telegrams

- ATel 16708: IceCube-Cascade 240714A: two coincident track-like events detected by IceCube
- ATel 16443: SN 2024bch: Upper limits from a neutrino search with IceCube
- ATel 16043: SN 2023ixf: Upper limits from a neutrino search with IceCube
- GCN 33430: GRB 230307A: Upper limits from a neutrino search with IceCube
- GCN 32665: GRB 221009A: Upper limits from a neutrino search with IceCube

Awards

- **IceCube Impact Award**, March 2023
  For essential contributions to infrastructure for gravitational wave alert follow-up and dedication to making the collaboration and its science more accessible.
- **Karl Guthe Jansky and Alice Knapp Jansky Scholarship**, May 2023
  Presented to a graduate student in the UW-Madison physics department interested in astrophysics and/or radio astronomy.

Invited Talks

- **NASA Goddard Space Flight Center (GSFC)**, July 2024
  Presentation for the Gamma-ray speakeasy meeting about realtime searches for transient neutrino sources, specifically GRB 221009A and GW follow-up

- **Center for Interdisciplinary Exploration and Research in Astrophysics (CIERA), Northwestern University,** May 2024
  Presentation for the Observers Group Meeting about neutrino astrophysics and realtime follow-up of GRB 221009A and GW sources
- **Madison Astronomical Society**, February 2024
  Presentation to a general audience about IceCube and short/long gamma-ray bursts
- **iTelescope.net webinar**, May 2023
  Presentation to a general audience, with an introduction to particle astrophysics, IceCube, and transients for the iTelescope.net group

Contributed Talks

- "Search for high energy neutrinos in LVK run O4 in realtime with the IceCube Neutrino Observatory." Oral presentation, 2024 APS April Meeting
- "Searches for IceCube Neutrinos Coincident with Gravitational Wave Events." Poster presentation, 38th International Cosmic Ray Conference (2023)
- "Exploring the Galactic neutrino flux origins using IceCube datasets." Poster presentation, 38th International Cosmic Ray Conference (2023)
- "Searches for neutrino emission from GRB 221009A with the IceCube Neutrino Observatory." Oral presentation, 2023 APS April Meeting

Leadership and Service Work

For the IceCube Collaboration

- Maintainer for the Fast Response Analysis code repository (May 2022–present)
- Analysis code and reproducibility reviewer (November 2022-present)
- WIPAC Journal Club organizer (September 2023-present)
- IceCube Summer School organizer (October 2022-June 2023)
  Coordinated the scientific schedule, moderated talks, worked with WIPAC leadership for student housing for hybrid meeting
- Created accessibility resources for the IceCube collaboration (2022)
  Hosted on GitHub: *https://github.com/jessiethw/accessible_examples*
- Provided technical support for hybrid IceCube Collaboration meeting (September 2022)
- Present IceCube science to the public at the Frozen Assets Festival (February 2022, 2024)
- Present at IceCube After School (February 2023, 2024): introduction to research for high school students

For the UW—Madison Physics Department

- Gender Minorities and Women in Physics Officer: Director of Outreach (May 2021—May 2022), Director of Information (May 2022—May 2023)
- GREAT IDEAS DEI Discussion Group lead (April 2021—August 2023)
  Organize and facilitate discussions centered around amplifying experiences of underrepresented groups in science
- Chair for Recruit and Welcome, Physics Graduate Student Council (May 2021—June 2022)

Science Communication (Astrobites Collaboration)

All posts: *https://astrobites.org/author/jthwaites/*

- Read scientific papers and write plain-language summaries for an undergraduate-level audience
- Chair of the scheduling committee, ombudsperson for the collaboration (2023-2024), and active committee member for DEI, editorial, and recruitment committees
- Co-wrote broader science guides covering:
    - Transient Astronomy (https://astrobites.org/2022/10/30/guide-to-transient-astronomy)
    - Gravitational Wave Astronomy (https://astrobites.org/2023/11/08/guide-to-gravitational-waves)
- Coordinated with Physical Review Journals for Astrobites partnership with PRJ
- Co-lead Astrobites coverage of upcoming 2024 APS April meeting with support from APS DAP

Teaching Experience

Physics Tutor, introductory physics Sept.—present
University of Wisconsin—Madison Physics Department, Madison, WI

Teaching Assistant, introductory algebra-based physics Sept.—Dec. 2020
University of Wisconsin—Madison Physics Department, Madison, WI
Lead 2 discussion sessions and one lab per week for 3 classes (approx. 75 students)

Physics Tutor and Laboratory Teaching Assistant Jan 2017—May 2019
College of Saint Benedict/Saint John's University, St. Joseph, MN

Programming skills

Data analysis for large datasets, Python, IDL, UNIX shell scripting, LaTeX, C++ (some experience in C++ based ROOT), FORTRAN, internal IceCube software (Skylab, csky, IceTray/realtime)

Maintenance of analysis code package: icecube/FastResponseAnalysis

Professional Society and Collaboration Membership

American Physical Society, IceCube Collaboration, Astrobites Collaboration